In the Claims

Current Status of Claims

1.(**currently amended**) A method ~~system for forming multiresolution wavelets~~ frame multi-resolution analysis comprising the steps of:

constructing isotropic, non-separable ideal windows in a dimension greater than or equal to 1,

constructing translation and dilation operators for the windows ~~adapted to form out of the ideal windows completely isotropic low pass filters, high pass filters and filters that cover a desired frequency range or plurality of frequency ranges from the isotropic ideal filters. into~~;

constructing isotropic, non-separable filters from the ideal windows, and the translation operators and the dilation operators, where the filters are selected from the group consisting of isotropic, non-separable low pass filters, isotropic, non-separable high pass filters and isotropic, non-separable filters that cover a desired frequency range or plurality of frequency ranges;

constructing isotropic, non-separable scaling functions and associated translation operators for use with the ~~low pass~~ isotropic, non-separable scaling functions; and

producing associated isotropic, non-separable wavelets from the isotropic, non-separable filters and the isotropic, non-separable scaling functions, where the wavelets and filters are ~~and low pass scaling functions~~ adapted to resolve or decompose a multidimensional signal into ~~various~~ a plurality of non-overlapping subsets or resolution levels.

2.(**currently amended**) The method of claim 1, further comprising the step of:

dividing each filter into at least one relative low pass component and at least one relative high pass components.

3.(**currently amended**) The method of claim 1, wherein the ~~method is used in~~ multidimensional signal is: ~~(i) data compression and storage for~~ a streaming video signal, a seismic imaging signal, ~~or~~ a digital medical imaging signal ~~of all types, (ii) image and signal enhancement, denoising and analysis for medical imaging, seismic imaging,~~ a satellite imaging signal, ~~and~~ a surveillance imaging signal, a target acquisition imaging signal, a radar imaging signal, a sonar imaging signal, or a pattern recognition imaging signal ~~and analysis, (iii) volume rendering and~~

~~segmentation, or motion analysis, and (iv) as a basis for digital algorithms for solving ordinary and partial differential equations in science, engineering, economics, and other disciplines.~~

~~3~~4.**(currently amended)** A method ~~system~~ for analyzing data comprising the steps of:

constructing at least one isotropic, non-separable wavelet including:

isotropic, non-separable filters having at least one ideal isotropic, non-separable window and necessary translation and dilation operators, where the filters are selected from the group consisting of low pass isotropic, non-separable filters, high pass isotropic, non-separable filters and isotropic, non-separable filters that cover a desired frequency range or plurality of frequency ranges;

isotropic scaling functions and associated translation operators for use with ~~low pass~~ the scaling functions; and

resolving or decomposing a multidimensional signal into ~~various~~ a plurality of non-overlapping subsets or resolution levels with the at least one isotropic, non-separable wavelet.

~~4~~5.**(currently amended)** The method of claim ~~1~~4, further comprising the step of:

dividing each isotropic, non-separable filter into at least one relative low pass isotropic, non-separable component and at least one relative high pass isotropic, non-separable components.

~~5~~6.**(currently amended)** The method of claim ~~1~~4, wherein the ~~method is used in~~ multidimensional signal is: ~~(i) data compression and storage for~~ a streaming video signal, a seismic imaging signal, ~~or~~ a digital medical imaging signal ~~of all types, (ii) image and signal enhancement, denoising and analysis for medical imaging, seismic imaging,~~ a satellite imaging signal, ~~and~~ a surveillance imaging signal, a target acquisition imaging signal, a radar imaging signal, a sonar imaging signal, or a pattern recognition imaging signal ~~and analysis, (iii) volume rendering and segmentation, or motion analysis, and (iv) as a basis for digital algorithms for solving ordinary and partial differential equations in science, engineering, economics, and other disciplines.~~

~~6~~7.**(currently amended)** A system for processing signals implemented on a computer comprising:

a processing unit having encoded thereon a completely isotropic, non-separable ideal filter

for frame multi-resolution analysis software including:

wavelets adapted to resolve a multidimensional signal into various resolution levels, where the wavelets are derived from:

isotropic, non-separable ideal windows or filters in a dimension greater than or equal to 1,

translation and dilation constructs or operators adapted to form completely isotropic, non-separable low pass filters, isotropic, non-separable high pass filters and isotropic, non-separable filters that cover a desired frequency range or plurality of frequency ranges from the isotropic ideal windows into; and

isotropic, non-separable scaling functions and associated translation operators for use with the ~~low-pass~~ scaling functions;

~~7~~8.**(currently amended)** The system of claim 67, wherein each isotropic, non-separable high pass and each isotropic, non-separable low pass filter comprise:

at least one isotropic, non-separable relative low pass component and at least one isotropic, non-separable relative high pass component.

~~8~~9.**(currently amended)** The system of claim ~~7~~8, wherein each isotropic, non-separable relative high pass component and each isotropic, non-separable relative low pass filter comprise:

at least one isotropic, non-separable relative low pass subcomponent and at least one isotropic, non-separable relative high pass subcomponent.

~~9~~10.**(currently amended)** The system of claim 67, wherein each isotropic, non-separable high pass and each isotropic, non-separable low pass filter comprise:

a plurality of isotropic, non-separable high pass and isotropic, non-separable low pass components, each component including at least one isotropic, non-separable relative low pass subcomponent and at least one isotropic, non-separable relative high pass subcomponent.

~~10~~11.**(currently amended)** A completely isotropic, intrinsically non-separable low pass filter or high pass filter implemented on a computer comprising:

isotropic, non-separable ideal windows in a dimension greater than or equal to 1, and

translation and dilation operators adapted to form out of the ideal windows completely isotropic, non-separable low pass filters, isotropic, non-separable high pass filters and isotropic, non-separable filters that cover a desired frequency range or plurality of frequency ranges from the isotropic ideal filters.

~~11~~12.**(currently amended)** The filter of claim ~~10~~11, wherein the isotropic, non-separable low pass filter comprises:

$$m_0(\xi) = \sqrt{2}\chi_{D/\sqrt{2}}(\xi),\ \xi \in \mathbf{T}^2.$$

~~12~~13.**(currently amended)** A completely isotropic, intrinsically non-separable scaling functions implemented on a computer comprising:

$$\phi = F^{-1}(\chi_{D,})$$

~~13~~14.**(currently amended)** An isotropic, non-separable wavelet scaling functions implemented on a computer comprising:

$$\phi(R) = \frac{J_{n/2}(\pi R)}{(2R)^{n/2}}, \quad R > 0 \tag{2}$$

~~14~~15.**(currently amended)** An isotropic, non-separable wavelet implemented on a computer comprising:

at least one isotropic, non-separable filter including at least one isotropic, non-separable ideal window and translation and dilation operators, where the filters are selected from the group consisting of isotropic, non-separable low pass filters, isotropic, non-separable high pass filters and isotropic, non-separable filters that cover a desired frequency range or plurality of frequency ranges; and

constructing isotropic scaling functions and associated translation operators for use with the ~~low pass~~ scaling functions.

~~15~~16.**(currently amended)** The ~~filter~~ wavelet of claim ~~14~~15, wherein the wavelet further comprises:

$$h_r = e_{\mathbf{q}_r} \chi_Q \qquad r \in \{0,1,\ldots,p-1\} \tag{15}$$

where $\{e_{A(\mathbf{k})} h_r : \mathbf{k} \in \mathbf{Z}^n, r = 0,1,\ldots,p-1\}$ is a Parseval frame for $L^2(Q)$ and for $\hat{W}_{-1}$, $\{T_{A(\mathbf{k})} F^{-1} h_r : \mathbf{k} \in \mathbf{Z}^n, r = 0,1,\ldots,p-1\}$ is a Parseval frame for W_{-1}, $\psi_r = D\mathcal{F}^{-1} h_r$ ($r = 0, 1, \ldots, p-1$), $\{T_k \psi_r : \mathbf{k} \in \mathbf{Z}^n, r = 0, 1,\ldots, p\text{-}1\}$ is a Parseval frame for W_0, and $\{\psi_r : r = 0, 1,\ldots, p\text{-}1\}$ is a Parseval frame multiwavelet set associated with the FMRA $\{V_j\}_{j}$.

17.(new) The method of claim 1, further comprising the step of

decomposing the multidimensional signal into a plurality of non-overlapping subsets or resolution levels using an equal plurality of isotropic, non-separable wavelets from the isotropic, non-separable filters and the isotropic, non-separable scaling functions.

18.(new) The method of claim 17, further comprising the step of

reconstructing a reconstructed multidimensional signal from the plurality of non-overlapping subsets or resolution levels, where the reconstructed multidimensional signal has enhanced boundary properties and has reduced noise.